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(54) Title: **AQUEOUS ODOR CONTROL COMPOSITION**

(57) Abstract: An aqueous composition and method for controlling odor associated with spills of organic material which can cause odors on carpets. The method comprises applying to the surface the aqueous composition comprising one or more strains of dormant bacteria, which, when activated, is effective to control odors, one or more enzymes and non-residual surfactant. The dormant bacterial preparation is applied to organic material which can cause odors, the bacteria becoming active and digesting the organic material.

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TITLE: AQUEOUS ODOR CONTROL COMPOSITIONFIELD OF THE INVENTION

The present invention is directed to an aqueous
5 odor control composition for controlling odor associated
with deposits on surfaces, particularly spills of organic
material on surfaces, more particularly on carpet,
fabric, upholstery or other fibrous material.

10 BACKGROUND OF THE INVENTION

There are many instances where, owing to deposits
of organic material on surfaces, offensive odors can
arise through the presence of the organic material or its
decomposition. For example, much household waste
15 contains organic material, which upon decomposition can
give rise to offensive odors. This is particularly true
where the household waste must be stored for a period of
time prior to its disposal. Similarly, many fibrous
materials utilized in household applications are also
20 susceptible to soiling by organic based material, which
can give rise to offensive odors. These fibrous
materials include carpet, upholstery, batting used for
mattresses, pillow and pad, as well as other relatively
porous surfaces encountered in the household or
25 commercial environment.

Many fibrous materials, such as acrylic,
polyester, polypropylene and wool, and particularly nylon
used in the manufacture of upholstery, carpets, batting
30 and household fabrics may be susceptible to staining
especially from the many food dyes used in beverages and
other foods as well as from other chemicals from many
sources. Nylon carpet fibers are often treated with
stain blockers such as a sulfonated phenol formaldehyde
35 condensate polymer, a sulfonated naphthol formaldehyde
condensate polymer, a hydrolyzed vinyl aromatic maleic
anhydride polymer, certain fluorochemicals or
combinations thereof. The stain blockers act to prevent

or reduce the ability of organic dyes, particularly acid dye colorants from chemically reacting with and bonding to the nylon. The fibrous material, especially carpet fibers are also commonly coated with a fluorochemical anti-soiling agent to improve the anti-staining or anti-soiling characteristics of the carpet surface. The anti-soiling fluorochemicals reduce the tendency of soil to adhere to the fiber making the clean up of any spills or soil on the carpet easier. The fluorochemicals also reduce fiber wetability, making for easy clean up of liquid spills through a simple process of blotting the spill. Examples of such fluorochemicals and other stain resistant chemicals are given, for example, in U.S. Patent numbers 4,680,212 and 4,925,707, the disclosures of which are incorporated herein by reference. The use of the stain blockers and fluorochemicals may not provide complete stain resistance to the carpet, as some materials may still penetrate the nylon fibers or react with the fibers, especially if left in contact with the carpet for extended periods of time. This may be especially true where the carpet is exposed to conditions such as direct sunlight or other UV sources or high traffic areas, as these conditions may cause the effectiveness of the fluorochemical and stain blocker coatings to be diminished.

In addition, especially in residential locations, the possibility of deposits of organic matter such as feces or urine from babies and pets can result in not only soiling of fibrous and other porous materials such as carpets and bedding but also a lingering odor and may, in extreme cases, require the replacement of the soiled object. In the past, various chemical compounds have been proposed to aid in removing odor in a cleaning process. Such chemicals generally act as odor inhibiting agents such as U.S. Patent No. 4,946,672 which describes the use of biguanidine polymer compositions as odor inhibiting agents. However, even in those cases where

the deposit is cleaned up and odor inhibiting agents utilized, the odor from such deposits may remain in the soiled objects and may become apparent as the effect of the odor masking agents wear off.

5

Deposits of various materials on carpet and other fibrous materials may also give rise to other concerns. Many of the deposit materials are capable of supporting microbial growth, especially in the case of feces which contains many bacteria. Some of the microbial that may grow, as a result of a deposit, may have the potential of causing disease in persons exposed to them, such as various bacteria, mold and mildew. Carpet and other fibrous material are also known to contain a number of naturally occurring bacteria and other organisms. Some of these bacteria may themselves give rise to odor due to incomplete digestion of organic material. There have been attempts to reduce the presence and number of bacteria present in carpet by utilizing various anti-microbial agents such as described in U.S. Patent Nos. 4,110,504 and 5,024,840. These agents are applied to carpet in a manner similar to the way stain blockers are applied to carpet. The use of anti-microbials, while reducing the number of bacteria associated with carpet, may raise other concerns such as the impact on human and animal health and the potential that some of the bacteria may become resistant to effects of the anti-microbials.

Many bacterial and fungal genera are known for use in odor control due to their capability for producing enzymes that are capable of breaking down organic material. Such bacteria are particularly useful where the organic material, if allowed to remain, will give rise to malodors. Several such bacterial and fungal genera such as Bacillus, Lactobacillus, Enterobacter, Streptococcus, Rhizopus, Nitrosomonas, Nitrobacter, Pseudomonas, Alcaligenes and Klebsiella, among others, are

known for use in such applications with Bacillus sp.
being the most prevalent in use in various applications.

For example, European Patent Application No.
5 732,396 describes the use of Bacillus sp. for odor
control of feedstuffs used in farming and JP Patent
Application No. 7-031,668 describes their use for odor
control of toilets, shoe boxes and pet litter. Other
uses of the Bacillus for odor control for baby diapers
10 and wallpaper are described in JP Patent Application Nos.
2-121,665 and 3-059,199 respectively. Preparations of
sporulated Bacillus in a form suitable for spraying or
otherwise distributing on a deposit, especially of pet
urine and feces, on a carpet for controlling odor are
15 presently marketed by The Bramton Company of Dallas,
Texas under the trademark OUTRIGHT. The bacterial
preparations are used to deodorize a deposit by
application directly on the deposit. Once the deposit is
deodorized, the bacteria are depleted from the site or
20 disposed of along with the deodorized material. In the
event of a new deposit on the carpet, the treatment must
be repeated.

There thus remains a need for a means for treating
25 surfaces, particularly carpet and other fibrous material
to counteract the effects of deposits and especially for
controlling odor associated with the deposits,
particularly deposited organic material.

30 SUMMARY OF THE INVENTION

The present invention provides in one aspect for a
method for controlling odor associated with deposits of
organic odor causing material in contact with a surface.
The method comprises applying to the organic odor causing
35 material an aqueous composition comprising one or more
strains of dormant bacteria, which, when activated, are
effective to control odors, one or more enzymes and a
non-residual surfactant. When the aqueous composition is

exposed to organic material that can cause odors, the bacteria associated with the aqueous composition are capable of becoming active and digesting the organic material.

5

In another aspect of the invention there is provided a composition for treating a surface, particularly a carpet, fabric or fibrous material to provide control of odor associated with deposits of organic odor causing material on the surface. The composition comprises one or more strains of dormant bacteria, which, when activated are effective to control odors, one or more enzymes, and a non-residual surfactant.

15

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is directed in one aspect to a method of controlling odor associated with deposits, particularly spills, of organic material which can cause odors on surfaces, particularly carpet or other fibrous materials. The present invention is also directed to the aqueous compositions useful for treating surfaces, particularly carpet or other fibrous material to make them capable of controlling odor as well as to the surfaces. In addition to controlling odor, the compositions may also aid in reducing the staining effects of organic material.

30

Many bacterial genera are known to produce enzymes that are capable of breaking down organic material. Such bacteria are particularly useful where the organic material, if allowed to remain, will give rise to malodors. Several such bacterial genera such as Bacillus, Lactobacillus, Enterobacter, Streptococcus, Nitrosomonas, Nitrobacter, Pseudomonas, Alcaligens and Klebsiella amongst others are known for use in such applications, with Bacillus and Lactobacillus sp. being

35

the most prevalent in use in various applications. Strains of bacteria from any of the above noted genera are useful in practicing the present invention. Preferably, the bacterial preparation for use in the present invention is one or more strains of Bacillus or Lactobacillus. More preferably, the strains of bacteria for use in the present invention are selected from Bacillus licheniformis, Bacillus pasteurii, Bacillus laevolacticus, Bacillus megaterium and Bacillus amyloliquefaciens. Each of these species has characteristics that make them most effective against particular types of organic materials. All of these species are capable of enhanced anaerobic and aerobic growth. Bacillus pasteurii is known for superior lipase production, while Bacillus laevolacticus has a very fast germination cycle. Bacillus amyloliquefaciens is high in production of protease enzymes.

The selection of the strains of bacteria for use in the present invention may depend upon many factors. One such factor is the nature of the organic material most commonly expected for the particular application. For example, in a commercial application, the most commonly expected deposits would be soil tracked in from out-of-doors, beverages such as coffee, tea, other food and the like, especially in a restaurant environment, and possibly, inks or toners for printers and other office equipment. Many of these materials are high in fatty components so the bacterial preparation may be enhanced for strains having high activity against such materials. One example of such a bacteria is Bacillus pasteurii known for superior lipase production. In a residential environment, the nature of the deposits may differ with out-of-doors soils, beverages, food and urine and feces from pets and children being most commonly encountered. Depending upon the nature of the deposited material, the preparation may be selected to contain strains having enhanced activity against such materials. Another factor

that may affect the nature of the deposit is the geographical location of the surface being treated. This factor would especially relate to the nature of deposits of out-of-doors soil and to the nature of food deposits.

- 5 Different regions are known to have different soil types and different regions may also have differences in the foods commonly consumed due to cultural and environmental factors. In addition, the temperature of the surface to be treated will influence the activity of the bacteria.
- 10 Depending on the strain selected the bacteria will tend to exhibit enhanced activity at higher temperatures. At lower ambient temperatures, more active strains may be desired.

- 15 The bacterial preparation will typically comprise one or more strains selected from the genera and species described above. When utilizing a mixture of more than one strain, each of the individual strains may comprise between 3% and 97% of the total of the bacteria present
- 20 in the preparation. Depending upon the bacteria, these percentages are based on the total cell number or colony forming units or the total mass of the bacterial preparation. For the Bacillus sp. the percentages are based on total cell number. Preferably, each of the
- 25 strains is present in sufficient numbers to make up 10% to 70% of the total bacteria in the preparation. When mixtures of more than two strains are employed, each of the strains is most preferably present in an amount of from 20% to 40% of the total bacteria in the preparation.
- 30 Particularly preferred preparations for general use in almost all applications are as follows:

% of total bacteria			
Preferred			
35	<u>Species</u>	<u>Range</u>	<u>Range</u>
	<u>Bacillus megaterium</u>	5-60	20-60
	<u>Bacillus pasteurii</u>	10-40	10-30
	<u>Bacillus laevolacticus</u>	10-40	10-30

<u>Bacillus amyloliquefaciens</u>	10-40	10-30
<u>Bacillus licheniformis</u>	10-40	10-30

5 In a preferred embodiment of the present invention
an effective amount of a bacterial composition comprising
one or more strains selected from the group consisting of
Bacillus licheniformis, Bacillus megaterium, Bacillus
10 pasteurii, Bacillus laevolacticus and Bacillus
amyloliquefaciens and combinations thereof are provided
in a state in which the composition may be applied to a
surface, such as carpet fiber or other fibrous material.
The effective amount is a sufficient number of bacteria
to provide a relatively uniform coverage of the surface
15 exposed to a deposit of an odor causing organic material.
The bacteria will then undergo rapid growth and consume
the odor causing material. The factors that can affect
the number of bacteria to be used relate in most part to
the nature of the surface to be protected. For carpet,
20 such factors include the nature of the fiber in terms of
the material, e.g. nylon or polypropylene and the like,
the characteristics of the yarn in the terms of the
denier and number of filaments and the characteristics of
the fiber in terms of the number of yarns and the twist.
25 These factors relate to the nature of the carpet in terms
of the weight (oz) or (g) and height of the pile. All of
these factors will affect the amount of exposed surface
of the fibers that might be covered by the bacterial
preparation. For most applications on carpet, between
30 about 10^6 and 10^8 cells per ml of the composition is
preferred.

The compositions are provided as a preparation of
a suspension of the Bacillus species, one or more enzymes
35 and a non-residual surfactant in a suitable aqueous
carrier, such as distilled water, tap water, a saline
solution or other such aqueous solutions.

The bacteria and particularly Bacillus species are provided as dormant cells. The term "dormant cells" is intended to encompass cells which are in a state which are required to be activated before they can undergo growth. One example of a dormant cell is a sporulated form of the bacteria where the spores must undergo activation and germination before growth of the bacteria can occur.

By providing the bacteria in a dormant or sporulated form, the bacteria are protected from environmental factors which may prove detrimental to active bacterial cells. These environmental factors may include exposure to heat, chemical agents, and UV radiation from sunlight as well as the exposure to air for those strains that may be predominantly anaerobic.

The sporulated or dormant strains of bacteria become activated and undergo germination in response to being exposed to organic material including organic material that can cause odors. The factors that promote the activation of the dormant or sporulated bacteria include the moisture and various organic compounds present in the deposit of organic material. Once activated, the bacteria undergo growth and replication, consuming the organic material in the deposit until the material is depleted.

The bacterial preparation may be provided as a concentrate to be diluted with the other ingredients. The concentrate may include other agents for improving viability of the bacterial preparation. The concentrate preferably contains between 10 and 20 times the number of cells or spores per ml of the final composition. Typically, the concentrate contains about 10^9 cells per ml. The concentrate is diluted with water or other aqueous carrier and the other ingredients to produce the composition which is directly applied to the surfaces,

such as for example, installed carpet and other fibrous material.

The composition also includes other agents namely
5 one or more enzymes, and a non-residual surfactant in addition to the bacteria spore blend. The enzymes typically employed in the composition are one or more lipase or protease enzymes, particularly amylase. The non-residual surfactant is one which does not leave an
10 appreciable residue upon drying. The nature of the surfactant will be selected based upon the non-residual property. Particularly preferred surfactants are the sulfosuccinate anionic surfactants, more particularly the sodium dialkyl sulfosuccinates and most particularly
15 sodium dihexyl sulfosuccinates such as COLAWET MA-80 available from The Thornley Company, Wilmington, DE.

The aqueous odor controlling bacterial composition of the present invention may be provided with other
20 ingredients depending upon the application or surface to be treated, such as masking agents, anti-foaming agents, or foaming agents. The masking agents are generally fragrances such as vanilla or fresh scent to initially mask the odor associated with the material on the carpet.
25 The anti-foaming agent for reducing surface tension for reduced absorbent surfaces may be any commonly utilized anti-foaming agent which would be suitable for the surface to be treated. One example of such an anti-foaming agent is a silicone based anti-foaming agent,
30 which may be utilized in compositions utilized for treating reduced absorbent surfaces, such as hard surfaces. The anti-foaming agent may also be used in compositions which are utilized in a spray bottle for direct application by the consumer, particularly for
35 carpet or other fibrous material.

Another additional ingredient which may be utilized in the composition depending upon the

application is a foaming agent for producing a foam composition for treating relatively absorbent surfaces, such as carpet and other fibrous material. This foaming agent is preferably a lauryl sulphate, more preferably an ammonium lauryl sulphate or sodium lauryl sulphate, most preferably sodium lauryl sulphate. The foaming agent is utilized to produce a composition which can be applied to the surfaces of higher absorbency to allow the composition to be worked into the surface. This may be of particular use for treating carpet and other fibrous material. The additional ingredients would be utilized in the compositions at the usually employed concentrations, generally 5 percent by weight or less based upon the total weight of the composition.

15

For treatment of most surfaces by spraying, the aqueous odor controlling bacterial composition of the present invention are preferably formulated to have the following composition:

20

		Range (% of total weight)		
	bacteria spore blend	3.0	to 10	
25	enzymes	0.1	to 5	
	isopropyl alcohol	0.001	to 5.000	
	masking agent	0.001	to 5.000	
	surfactant	0.001	to 5.000	
	acetic acid	0.001	to 5.000	adjust ph as necessary
30	balance water			

More preferably, the compositions of the present invention will be as follows:

35

		Range (% of total weight)		
	bacteria spore blend	3.000	to 7.000	
	enzymes	0.1	to 2.000	
40	isopropyl alcohol	0.01	to 4.000	
	masking agent	0.01	to 1.000	
	surfactant	0.01	to 1.000	
	acetic acid	0.01	to 5.000	adjust ph as necessary
	balance water			

45

A particularly preferred composition according to the present invention is as follows:

Depending upon the state of the surface material, the composition may be applied in many different ways. The composition may be applied by dipping the material in the composition or by spraying the composition onto the material. In any of these cases, once the surface material is treated with the composition, the treated material is allowed to dry by way of applied heat or simply by ambient drying.

The compositions and method of the present invention provide for effective odor control for surfaces, such as carpet. The use of the bacterial preparations, particularly the sporulated forms of Bacillus, provide for control of odor caused by deposits of organic odor causing material on surfaces such as carpets and other fibrous material. Once the deposit comes into contact with the bacteria, the bacteria germinate, and commence growing by feeding on the organic material as a food source. This bacterial growth commences within 20 minutes providing noticeable odor reduction results within 24 and 48 hours after the bacteria encounter the deposit. It is desirable to initially mask the odor using odor masking agents or neutralize the odor using odor neutralizing agents such as sodium bicarbonate or molecular sieves until the sporulated bacteria can germinate, grow and effectively decompose the odor causing agents. The composition also includes suitable protease and/or lipase enzymes to commence the digestion of the odor causing material until the bacteria commence their growth stage and can take over the digestion of the odor causing material.

(% of total weight)

35	bacteria spore blend	5		
	enzymes	1.5		
	isopropyl alcohol	1.0		
	masking agent	0.5		
40	surfactant	0.5		
	acetic acid	0.01	to	5.000
	balance water			adjust ph as necessary

The composition is applied to a surface such as an installed carpet either by way of directly spraying a soiled area with the composition or diluting the composition further with water and applying it to the carpet with a carpet cleaning machine. When applying the composition to an installed carpet, it is not essential, but preferred that the composition be applied thoroughly and evenly throughout the length of the pile, especially reaching down to the base of the pile fiber. This is generally achieved by applying an aqueous foaming bacterial preparation to the carpet and then working the fibers to improve the contact, distribution and penetration of the bacterial preparation. This is most commonly achieved by use of a pile brush operated either by hand or automatically for example, utilizing a cleaning device such as is commonly available commercially. To enhance the penetration of the bacterial preparation, the fibers of the carpet may initially be wetted through an application of a detergent solution. This is most commonly applied where the installed carpet is cleaned using a cleaning machine prior to the application of the bacterial preparation. While the carpet fibers are still moist, the bacterial preparation may be applied and worked into the carpet, utilizing the pile brush. Once the carpet has been so treated, it is dried, either by allowing it to dry in the air at ambient temperature or through the use of hot air blown through the pile of the carpet to increase the speed of drying of the carpet. It is suggested that for optimum odor control the carpet be treated with the odor controlling bacterial preparation on a routine basis such as after each wet cleaning. This can be easily accomplished after cleaning with the preparation applied to the carpet either when still wet from the cleaning or after the carpet has dried. Preferably, the preparation is applied to the carpet while still wet, worked into the

carpet with a pile brush and the carpet is allowed to dry naturally.

In addition to providing for removal of
5 potentially odor causing organic material associated with
deposits on surfaces such as carpet and other fibrous
material, the use of the bacterial preparations of the
present invention provides other benefits. It has been
found that the bacterial preparation associated with the
10 carpet fiber or other fibrous material enhances the anti-
stain characteristics of the carpet. Many of the stain
causing materials are organic in nature and it has been
found that the bacteria can utilize such organic
materials as a food source. As the bacteria consume the
15 stain causing material, the staining properties of the
compounds are reduced.

The method and compositions of the present
invention are especially suitable for use with carpet as
20 described in the specific examples set out above. These
methods and compositions are also suitable for use with
other fibrous material that may be susceptible to the
effects of deposits of organic material. Examples of
such other fibrous materials include rugs, upholstery
25 fabrics, automotive fabrics, bedding, clothing, etc.

For example, other fibrous materials, such as
upholstery fabrics, automotive fabrics may be treated by
applying the composition to the fabric by way of directly
30 spraying the soiled area with the composition or diluting
the composition with water and utilizing a cleaning
machine. It is preferred that the composition be applied
thoroughly and evenly throughout the soiled area. This
may generally be achieved by utilizing a foaming
35 preparation which is sprayed on the soiled area and then
worked into the area. Alternatively, an aqueous non
foaming preparation may be utilized which will be sprayed
on the soiled area to completely saturate the area.

In addition to upholstery and automotive fabrics, other fibrous material such as bedding, clothing, etc., may also be treated with the aqueous compositions of the present invention to remove odor and stain associated with such fibrous materials. In these situations, the soiled area is treated with the aqueous preparation to saturate the soiled area.

10 The methods and composition of the present invention provide for an easy to use effective way of treating fibrous material to remove stain and odor causing organic materials.

15 Although various preferred embodiments of the present invention have been described herein in detail, it will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended
20 claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A method for controlling odor associated with deposits
5 of organic material which can cause odors on surfaces,
the method comprising applying to the surface an aqueous
composition comprising one or more strains of dormant
bacteria, which, when activated, is effective to control
10 odors, one or more enzymes and a non-residual surfactant,
the dormant bacterial preparation being allowed to become
associated with the surface exposed to organic material
which can cause odors, the bacteria becoming active and
digesting the organic material.

15 2. A method as claimed in claim 1 wherein the dormant
bacteria are sporulated forms of one or more strains
selected from the bacterial genera Bacillus.

3. A method as claimed in claim 1 wherein the dormant
20 bacteria are sporulated forms of one or more strains
selected from the group of bacterial species consisting
essentially of Bacillus licheniformis, Bacillus
megaterium, Bacillus pasteurii, Bacillus laevolacticus
and Bacillus amyloliquefaciens.

25 4. A method as claimed in claim 1 wherein the surface to
be treated is carpet, fabric, upholstery, batting,
bedding or other fibrous material.

30 5. A method as claimed in claim 4 wherein the composition
comprises:

	Range (% of total weight)		
35 bacteria spore blend	3.0	to 10	
enzymes	0.1	to 5	
isopropyl alcohol	0.001	to 5.000	
masking agent	0.001	to 5.000	
surfactant	0.001	to 5.000	
40 acetic acid	0.001	to 5.000	adjust ph as necessary
balance water			

6. An aqueous odor controlling bacterial composition for surfaces to impart odor control to the surface, the composition comprising one or more strains of dormant bacteria, which when activated are effective to control odors, one or more enzymes and a non-residual surfactant.

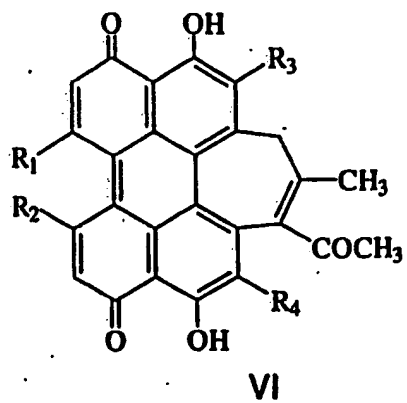
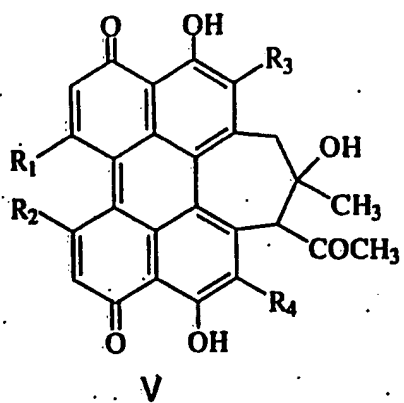
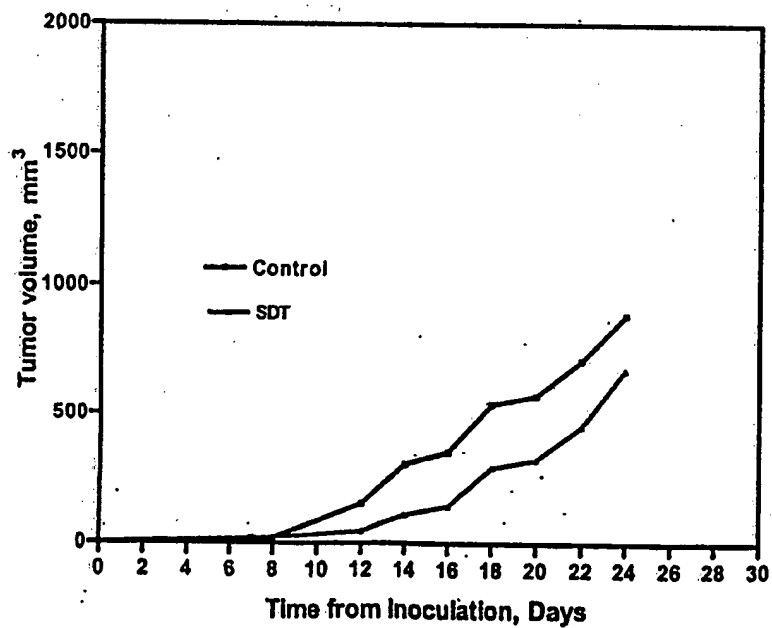
7. An aqueous odor controlling bacterial composition as claimed in claim 6 wherein the dormant bacteria are one or more strains selected from the group of bacterial genera consisting of Bacillus, Enterobacter, Streptococcus, Nitrosomonas, Nitrobacter, Pseudomonas, Alcaligenes and Klebsiella.

8. An aqueous odor controlling bacterial composition as claimed in claim 7 wherein the dormant bacteria are one or more strains selected from the group of bacterial species consisting essentially of Bacillus licheniformis, Bacillus megaterium Bacillus pasteurii, Bacillus laevolacticus and Bacillus amyloliquefaciens.

9. An aqueous odor controlling bacterial composition as claimed in claim 8 wherein the surface to be treated is carpet fabric, upholstery, batting, bedding or other fibrous material.

10. An aqueous odor controlling bacterial composition as claimed in claim 9 wherein the composition comprises:

	Range (% of total weight)		
30	bacteria spore blend	3.0 to 10	
	enzymes	0.1 to 5	
35	isopropyl alcohol	0.001 to 5.000	
	masking agent	0.001 to 5.000	
	surfactant	0.001 to 5.000	
	acetic acid	0.001 to 5.000	
	balance water		adjust ph as necessary

**Fig. 1****Fig. 2**

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 D06M16/00 A61L9/01 D06M13/00 A01K1/015 C11D11/00
C11D3/00 C11D3/38 C11D3/386

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D06M A61L A01K C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00 03752 A (LIFE SCIENCE TGO S R L ; CORDICK RAE ANNE (CA); FREDENBURGH JEFFREY KE) 27 January 2000 (2000-01-27) page 19, lines 17-21; claims 7-9, 18-21	1-4, 6-9
X	US 5 683 575 A (MCELROY DERMOT JOSEPH ET AL) 4 November 1997 (1997-11-04) column 1, line 54 - column 2, line 25	6, 7
P, X	WO 02 33035 A (TEASDALE STEVE ; LAFRANCE CORINNE (CA); 3840158 CANADA INC (CA)) 25 April 2002 (2002-04-25) the whole document	6
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	US 2003/089381 A1 (MANNING JAMES T) 15 May 2003 (2003-05-15) paragraphs '0001!, '0041!, '0046!, '0057!, '0058! examples	1,2,4-7, 9,10
E	WO 03 056096 A (LIFE SCIENCES TGO SRL ; CORDICK RAE ANNE (CA); FREDENBURGH JEFFREY KEN) 10 July 2003 (2003-07-10) the whole document	1-4,6-9
A	EP 0 878 202 A (EUROVIX S R L) 18 November 1998 (1998-11-18) the whole document	1-10
A	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 11, 26 December 1995 (1995-12-26) & JP 7 222790 A (MITSUBISHI MATERIALS CORP), 22 August 1995 (1995-08-22) abstract	1-10
A	PATENT ABSTRACTS OF JAPAN vol. 0143, no. 34 (C-0742), 18 July 1990 (1990-07-18) & JP 2 121665 A (MITSUBISHI MINING & CEMENT CO LTD), 9 May 1990 (1990-05-09) cited in the application abstract	1-10
A	-& JP 02 121665 A (MITSUBISHI MINING & CEMENT CO LTD) 9 May 1990 (1990-05-09) cited in the application the whole document	1-10
A	EP 0 476 915 A (CLOROX CO) 25 March 1992 (1992-03-25) the whole document	1-10
A	US 6 325 934 B1 (STAPLETON JR RAYMOND D ET AL) 4 December 2001 (2001-12-04) the whole document	1-10
A	US 5 154 594 A (GAMLEN MEREDITH L) 13 October 1992 (1992-10-13) the whole document	1-10
A	GB 2 362 814 A (HINMAN ANTHONY PHILIP) 5 December 2001 (2001-12-05) the whole document	1-10
A	WO 00 63338 A (SPARTAN CHEMICAL COMPANY INC) 26 October 2000 (2000-10-26) the whole document	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/IB 03/00268

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0003752	A	27-01-2000	AT 247988 T AU 761980 B2 AU 4596599 A WO 0003752 A1 DE 69910790 D1 EP 1096959 A1	15-09-2003 12-06-2003 07-02-2000 27-01-2000 02-10-2003 09-05-2001
US 5683575	A	04-11-1997	AT 158266 T AU 3766293 A CA 2132860 A1 DE 69314015 D1 DE 69314015 T2 EP 0632790 A1 ES 2110600 T3 GB 2279947 A, B GR 3025677 T3 WO 9319013 A1 US 5866002 A	15-10-1997 21-10-1993 30-09-1993 23-10-1997 16-04-1998 11-01-1995 16-02-1998 18-01-1995 31-03-1998 30-09-1993 02-02-1999
WO 0233035	A	25-04-2002	US 6376451 B1 AU 1368902 A WO 0233035 A1 CA 2426080 A1 EP 1326954 A1 US 2002082184 A1 JP 2002129190 A	23-04-2002 29-04-2002 25-04-2002 25-04-2002 16-07-2003 27-06-2002 09-05-2002
US 2003089381	A1	15-05-2003	WO 03018734 A1	06-03-2003
WO 03056096	A	10-07-2003	WO 03056096 A1	10-07-2003
EP 0878202	A	18-11-1998	IT MI971141 A1 EP 0878202 A2	16-11-1998 18-11-1998
JP 7222790	A	22-08-1995	NONE	
JP 2121665	A	09-05-1990	NONE	
EP 0476915	A	25-03-1992	AT 153059 T AU 8452191 A CA 2051171 A1 DE 69126079 D1 DE 69126079 T2 EP 0476915 A2 ES 2102995 T3 JP 3107318 B2 JP 6146173 A US 6265191 B1	15-05-1997 16-04-1992 15-03-1992 19-06-1997 28-08-1997 25-03-1992 16-08-1997 06-11-2000 27-05-1994 24-07-2001
US 6325934	B1	04-12-2001	NONE	
US 5154594	A	13-10-1992	NONE	
GB 2362814	A	05-12-2001	NONE	
WO 0063338	A	26-10-2000	US 6180585 B1 US 6165965 A AU 764506 B2	30-01-2001 26-12-2000 21-08-2003

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No. ...

PCT/IB 03/00268

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0063338	A	AU 3929100 A	02-11-2000
		BR 0009794 A	05-03-2002
		CA 2367940 A1	26-10-2000
		EP 1171565 A1	16-01-2002
		NO 20015004 A	15-10-2001
		NZ 514659 A	25-10-2002
		WO 0063338 A1	26-10-2000
